

## SECTION 02100 - SITE WORK

### Seeding

Provide for soil preparation and over seeding of turf areas. Soil preparation shall require incorporation of 20% organic matter (composted leaves or other approved product) by volume tilled to a minimum of 4". The surface shall then have 2" of sandy loam top soil placed and raked smooth. Soil preparation shall be approved by the University representative prior to seeding. Seeding shall be at an 8#/1000 square feet rate and seed shall be mulched with tacked straw or cellulose fiber to hold the grass seed in contact with the soil without inhibiting germination (1/2"-1" thick layer or 60-80 bales per acre. Rate for cellulose fiber: 1500 pounds per acre)

### Sodding

Contractor shall provide soil preparation and sodding of turf areas. Soil preparation shall require incorporation of 20% organic matter (composted leaves or other approved product) by volume tilled in a minimum of 4". The surface shall then have 2" of sandy loam top soil placed and raked smooth prior to laying sod. The University representative shall approve the grade prior to laying of sod. Sod shall be a Maryland certified 3 blend mix of turf type tall fescue. Sod shall be placed with all edges butted tight and joints staggered. Areas sodded adjacent to existing turf areas shall be laid level to existing grade. All sodded areas shall be lightly watered before laying, then rolled and thoroughly irrigated with a minimum of 1/2" of water. Sod shall be kept moist until it has become established and accepted by the Project Manager. All spoils shall be removed prior to leaving the site.

### Trees, Shrubs and Groundcover

See soil preparation under "**Sodding**" for plant bed preparation. Install shrubs and trees as shown on the attached planting details.

## Part 1.0 General

### A. Description of work

1. Work under this item shall consist of all labor, equipment and materials to furnish and plant trees, shrubs, vines and groundcover plants and transplant the same, in the location and of the type and size indicated on the Contract Drawings or specified elsewhere in the contract Documents, and mulching of the tree pits, shrub beds and/or vine and groundcover areas in accordance with the details shown in these Specifications or as ordered by the Owner/Engineer. It shall also include all incidental

operations such as, but not limited to, all required excavation, preparation of tree pits or planting beds, furnishing and placing of the planting soil/topsoil, guying or staking, fertilizing, watering, pruning, spraying establishing, and replacing of dead and unsatisfactory plants or unsatisfactory material prior to the end of the period of establishment.

2. Where referred to in these specifications, Standard Specifications shall mean the Maryland State Highway Administration (MSHA) Standard Specifications for Construction and Materials dated October 1993, amended to date.

## **Part 2. - Products**

### **A. Materials**

1. Planting Mix will consist of the following ratio of materials: two-thirds topsoil and one-third Earthlife by volume. Components shall be thoroughly mixed together. No soil mix particles will exceed 3/4 of an inch.
2. Water will be furnished by the University for the establishment and maintenance of plants and seed areas. Contractor shall furnish his own hoses, attachments and accessories.
3. Mulch shall be commercially prepared shredded composted hardwood bark, free of foreign matter or toxic substances.
4. Plant materials defined as trees, shrubs and seeded or sodded areas. No substitutions to be made without written permission of Project Manager. Plant materials failing to meet requirements herein will not be accepted.
5. The Contractor shall, within ten (10) days after award of Contract, submit complete and detailed information concerning the source of supply of plants and plant materials.
6. Types, Quality and Size: Refer to Plant List on drawings. Nomenclature: The specified and common names of plants herein specified conform with the approved names given in the most recent edition of "STANDARDIZED PLANT NAMES" prepared by the American Joint Committee on Horticultural Nomenclature, and "AMERICAN STANDARD FOR NURSERY STOCK", American Association of Nurserymen.
7. Quality: Plants shall be in accordance with American Standard for Nursery Stock Z60.1 latest versions of rules and grading adopted by the American Association of Nurserymen, Inc. and shall be certified nursery stock.

8. Unless specifically noted otherwise, plants shall be of selected specimen quality, symmetrical, so trained or favored in its development and appearance as to be superior in form, number of branches, compactness and symmetry. Plants shall have a normal habit of growth and shall be sound, healthy, vigorous and free of disease, insect pests, eggs or larvae, and shall have healthy, well developed root systems. Trees shall have a single leader. Ground cover to have been growing for at least three (3) months in size of pot specified with ample runners and foliage. Plant materials which in the opinion of the Project Manager do not meet the selected specimen quality standards herein, will be rejected.

9. Plants shall not be pruned before delivery. Trees which have a damaged or crooked leader, or multiple leaders, unless specifically specified, will be rejected. Trees with abrasion of the bark, sunscalds, disfiguring knots, or fresh cut of limbs over 1-1/4 inches which have not completely calloused, will be rejected. Plants shall be fresh dug. No heeled in plants or plants from cold storage will be accepted.

10. Size: Plants shall be measured when branches are in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch tip to branch tip. Caliper measurement shall be taken at a point on the trunk 6 inches above natural ground line for trees up to 4 inches in caliper and at a point 12 inches above the natural ground line for trees over 4 inches in caliper. If a range of size is given, no plant shall be less than the minimum size and not less than 50% of the plants shall be as large as the upper half of the range specified. The measurements specified are the minimum size acceptable and are the measurements after pruning, where pruning is required. Plants that meet the measurements specified, but do not possess a normal balance between height and spread, will be rejected. Shrubs shall be matched specimens from a single block source.

11. Plants shall be dug and prepared for shipment in a manner that will not cause damage to the branches, shape and future development of the plants after replanting. Plant material labels shall be securely attached by wire to plant material delivered to the planting site for the purpose of inspection and plant identification.

12. Balled and Burlapped Plants:

- a. Plants designated "B & B" in the plant list to be furnished shall be adequately balled with firm natural balls of earth of diameter and depth not less than that recommended by the American Standard for Nursery Stock. Balls shall be firmly wrapped with untreated burlap.
- b. Plants which are 2 inches in caliper or over shall be drumlaced.
- c. No balled plants shall be planted if the ball is cracked, broken or loosely wrapped either before or during the process of planting.

13. Container Grown Plants: Plants so designated shall be pot grown with well established root systems sufficient to hold the earth together intact, after removal from the pot.

14. Protection Against Drying: Root balls of plants shall be adequately protected at all times from sun and drying winds. Balled and burlapped plants which cannot be planted immediately upon delivery shall be well protected with soil, or other acceptable material. Plants shall not remain unplanted for longer than three days after delivery.

15. Guying, Staking and Wrapping Materials:

- a. Hose shall be two-ply reinforced black rubber hose sections, 3/4 inch in diameter, each long enough to fully protect branches and trunk.
- b. Location stakes for planting pits to be of 1" X 2" sound wood, 24 inches in length, with square top and pointed bottom. Label stakes with plant name.
- c. Guy wires shall be no. 12 gauge, pliable, rustproof metal.
- d. Guy wires shall be galvanized, 18 gauge wire and twisted to tighten.

16. Stakes for planting shall be 2" X 2" X 8' or 2" X 2" X 24" hardwood, straight with square top and pointed bottom. Length of stake determined by size of tree.

**Part 3.0 - Execution**

**A. Schedule**

1. Planting periods shall conform to Standard Specification Article 710.01.01
2. Trees and shrubs shall be planted after landscape grading and before sod or seed is installed except for the establishment of erosion control requirements.

**B. Planting Preparation**

1. Plants shall be planted in individual pits. Tree and shrub planting pits shall be of the size and shape shown on the contract drawings. Excavated subgrade soils shall be removed from the site and disposed of by the Contractor except for that needed to construct saucers around planting pits.
2. Notify the Project Manager in writing within 24 hours before plant installation, of surface soil or surface drainage conditions which the Contractor considers detrimental to growth of plant material.
3. When utility, rock or other unsuitable subsurface conditions are encountered in plant pits, the Project Manager or his representative will direct that plants be relocated to other satisfactory locations on the site. The Contractor will backfill abandoned pits with excavated soil compacting in twelve inch (12") layers to compacted original grade.
4. Planting pits shall be filled with water twice within 24 hour period before any plant material is installed. If drainage is unsatisfactory for plant growth, the Contractor shall notify the Project Manager in writing before plant installation.
5. Planting areas shall be free of debris or other deleterious matter prior to planting.
6. The Contractor shall stake out on the ground locations for plants and obtain approval of the Project Manager or his representative before excavation of the planting pit is begun. Contractor must clear excavation through the private utility representatives.

### **C. Planting and Related**

1. Before setting trees or shrubs, sufficient backfill will be lightly tamped in bottom of pit so that tree will be proper height when settled. Set trees and shrubs vertically and plumb with 1/5 of the rootball above grade. Using planting mix, backfill planting pit. When pit has been backfilled approximately 2/3 full, tamp and water thoroughly to eliminate air pockets. The remainder of the pit shall than be filled with planting mix, thoroughly tamped and saturated with water, within the same day of planting. Saturation with water means through wetting of backfill in the pits and rootball, applied only by an open-ended hose at low pressure. When planted, watered, and fully settled, plants shall be firmly vertical.
  2. Container grown plants shall be removed from their containers and the rootball scored with a sharp knife from top to bottom of the root ball to a depth of one inch (1") or outer layer of roots loosen from rootball before planting.
  3. On slopes, soil to be formed into an adequate compacted shoulder on downhill side with slope on uphill side regraded to form water-retaining saucer. Blend saucer into surrounding grade.
  4. Cut ropes, or strings, and burlap from half of ball after plant has been set. Leave burlap or cloth wrapping intact around balls.
  5. For each tree planted a saucer six inches above grade outside the periphery of each planting pit is to be constructed.
  6. Mulch plant beds and pits three (3) inches deep immediately after planting.
  7. Water plants immediately after planting. Re-shape planting areas to conform to specified grades after full settlement has occurred and restore the mulch. Deciduous trees will be wrapped with an approved tree wrapping material overlapping one-half the width of the material, wound from the ground line to the lowest main branches. Wrapping will be securely tied with twine at approximately eighteen inch (18") intervals along the trunk. Wrapping material to be maintained in place by the Contractor until final acceptance of the contract. Prior to wrapping, deciduous tree trunks will be thoroughly wetted with Lindane or Thiodan insecticide. Care will be given to wet bark cracks and crevices.
- I. Prune new plants only at time of planting and according to standard horticultural practices to preserve the natural character of the plant. Do not shear evergreen plants and prune only under the direction of the University Inspector. Pruning and trimming shall include removing dead wood, suckers,

and broken or badly bruised branches from plants and taken off campus. Use only clean sharp tools.

J. Protection shall be provided for existing and new plant materials and site structures against trespassing and damage during the construction period.

### 3.04 STAKING AND GUYING

A. Deciduous and evergreen trees will be braced according to contract drawings. In staking, the Contractor will avoid damage to branches of trees, particularly, evergreen and low branched minor trees. Trees less than five feet in height or less than three (3) inches in caliper shall be secured with three (3) hardwood stakes 2" X 2" X 8' within twenty-four hours (24) of planting. Hose and guy wires shall conform to specified materials. Trees over five feet in height or three (3) inches in caliper or greater shall be secured with three (3) ground level tree stakes and guy wires within twenty-four hours of planting. Three (3) pointed stakes, each two by twenty-four inches, will be driven into the ground below grade. Stakes will be driven equidistant around the tree (120 degrees), outside the planting pit to solid bearing soil. Install two strands of twisted #12 gauge, galvanized, soft steel guy wire from each stake around the tree at the lower most branch (through protective 3/4 inch black rubber hose sections, each long enough to fully protect all branches and trunk) and return to the stake. At the base of each guy wire, and adjacent to each stake, a galvanized, drop forged, eye and steel turnbuckle (5/16 inch diameter by 4-1/2 inch opening length) will be inserted. Turnbuckles will be initially installed in a fully open position.

B. The guy wires are to be tightly twisted. As trees settle, perform necessary tightening of guywires to secure even tension at each stake so that trees are held firmly and vertically. In areas where space is too limited for guying, the Project Manager or his representative will authorize use of the Alternate Staking and Planting Detail for Trees.

### 3.05 CLEAN-UP

A. During the course of the project, excess and waste materials to be continuously and promptly removed, turf areas kept clear, and reasonable precautions taken to avoid damage to existing structures, plants, and grass. When planting in areas has been completed, debris rubbish, subsoil and waste materials to be cleaned-up and removed. Existing turf areas which have been damaged by work shall be regraded and seeded or sodded. Prior to project acceptance, entire areas to be neat and clean.

### 3.06 REPLACEMENT

- A. Dead or unhealthy plants removed from the site during the planting season shall be replaced at once within the same planting season. Plants removed between planting seasons shall be replaced during the next proper planting season.
- B. When plant replacements are made, plants, plant soil mix, fertilizer, mulch, etc. shall be replaced to conform with original specifications and reinspected for compliance with Contract Requirements.
- C. Replacements shall be at the Contractor's expense.

### 3.07 MAINTENANCE

- A. Maintenance of plant material (excluding sod and seed) shall include pruning, watering, cultivating, weeding, spraying for insects and disease, mulching, fertilizing, straightening plants which lean or settle out of plumb (such adjustments to include excavating ground and leveling or raising of rootball) and tightening and repairing guy wires and stakes.
- B. The Contractor shall fully perform maintenance every 30 days during the growing season and continued maintenance until the end of the one year guarantee period.
- C. Dead or dying plants shall be removed within ten (10) working days after notification by the Project Manager.

### 3.08 INSPECTION FOR INTERIM ACCEPTANCE

- A. The Project Manager and the Contractor will inspect work for completion upon written request of the Contractor's anticipated date of inspection. The request shall be received at least five (5) calendar days before the anticipated date of inspection. Interim acceptance of plant material by the Project Manager shall be for conformation to specified species, size, quality and installation standards. The Contractor shall repair any discrepancies required for conformation to drawings and specifications. After discrepancies are corrected by the Contractor, the Project Manager will issue a Certificate of Interim Acceptance and the Guarantee Period will begin as of date of written Interim Acceptance.

### 3.09 INSPECTION FOR FINAL ACCEPTANCE

- A. At the end of the guarantee period the Project Manager will inspect guarantee work for Final Acceptance, upon written request of the Contractor. The request shall be received at least ten (10) calendar days before the anticipated date for Final Inspection. Upon completion, reinspection and approval by the Project Manager, of repairs or replacements, the work shall be accepted in writing by

the Project Manager via a letter of Final Acceptance, and the University's personnel shall assume maintenance of the project.

### 3.10 GUARANTEE

- A. Plant material (excluding sod) shall be guaranteed to be in a healthy vigorous condition in the opinion of the Project Manager for one year from the date of Project Interim Acceptance. A one time replacement policy shall be in effect on all plant material to include seeding and sodding. At the end of the guarantee period live and healthy plants will be accepted; plants not accepted shall be replaced by the Contractor as herein specified.
- B. The Contractor shall remove and replace, without cost to the University, and as soon as weather conditions permit, or within the next time of planting period, dead plants and plants not in a vigorous thriving condition as determined by the Project Manager. The plants shall be free of dead and dying branches and branch tips, and shall bear foliage of a normal density, size and color. Replacements shall closely match adjacent specimens of the same species and shall be subject to requirements of these specifications.
- C. Plants having die-back beyond normal pruning limit as determined by the Project Manager shall be replaced by the Contractor at no cost to the University.

## **FINISHED GRADING**

### PART 1: GENERAL

#### 1.01 SCOPE OF WORK

- A. Work includes spreading topsoil, preparing planting mix, installing planting mix, fertilizing and liming.
- B. Topsoil shall not be spread until underground pipework and fine subgrading is completed to the satisfaction of the Project Manager in accordance with the drawings.
- C. Unsurfaced areas subgrade shall be brought to contours or spot elevations shown less topsoil depth specified, with a maximum tolerance of 0.2 foot. Unsurfaced areas shall have a minimum gradient of 2%. Adjacent to surfaced areas of any kind, subgrade to be brought to exactly grades shown minus topsoil depth.

### PART 2: MATERIALS

A. Topsoil shall have a pH value between 6 and 7 and shall be fertile, friable, natural loam containing organic matter of 2% or greater and shall be capable of sustaining vigorous plant growth. It shall be free of any admixture of subsoil, stones, lumps, clods of hard earth, plants or their roots, sticks, or other extraneous material. Topsoil shall not be used for planting operations while in a frozen or muddy condition. Topsoil sources shall be tested at the expense of the Contractor for pH and soluble salts. Test results must be presented to the Landscape Architect prior to placement of topsoil on site. The mechanical analysis of the topsoil shall be 50-60% sand, 15-25% silt, 10-15% clay.

B. Composted sewage sludge approved screened polymer-dewatered sewage sludge with a pH of 6.2-7.2.

### PART 3: INSTALLATION

#### 3.01 FINISHED GRADING

A. Uniformly grade of areas covered by project, including transition areas. Finished surface to be smooth, compacted and free from irregular surface changes. Ditches and swales to readily drain as shown on plans and to be free of humps or hollows.

1. For Unsurfaced Areas: Subgrade to be brought to contours or spot elevations shown less topsoil depth specified, with a maximum tolerance of 0.2 foot. Adjacent to surfaced areas of any kind, subgrade shall have maximum tolerance of 0.5 foot, minus topsoil depth.

2. For Surfaced Areas: Subgrade to be brought to contours, spot elevations or profile shown on drawings, plus depth of respective surfaces with maximum tolerance of 0.05 foot.

#### 4.01 EXECUTION

A. Immediately prior to dumping and spreading topsoil, subsurface shall be loosened by discing or by scarifying to depth of at least 4" to permit through bonding. Fine grade all areas to be topsoiled to new contour grades, less topsoil depth.

B. During the spreading operation, the topsoil shall be raked and all stones in excess of one inch (1") in diameter and all rubbish shall be removed.

C. The topsoil shall have a minimum thickness of four inches (4") after natural settlement and light rolling and shall conform to the grades and elevations as shown on the plans. Do not place topsoil when muddy or frozen conditions exist.

D. Topsoil shall be spread in all disturbed areas.

E. Topsoil from Patapsco River Valley will not be acceptable.

- F. Paved areas shall be kept clean; any topsoil or any other soil brought upon them in connection with these operations shall be removed promptly.
- G. Newly graded areas shall be protected from actions of elements and any settlement or washing that may occur from that or any other case, prior to acceptance or work, shall be repaired and grades re-established to required elevations and slopes. Fill to required subgrade levels in areas where settlement occurs and re-establish grades to required elevations and slopes.
- H. Compaction shall be accomplished while the fill material is at the specified moisture content. Compaction of each layer shall be continuous over its entire area and the compaction equipment shall make sufficient trips to insure the required density has been obtained.

#### 5.01 ADJUSTMENTS AND CLEANING

- A. All area found, to be less than specified thickness shall be brought to proper thickness and grade.
- B. Paved areas shall be kept clean; any topsoil or any other soil brought upon them in connection with these operations shall be removed promptly.
- C. Newly graded areas shall be protected from actions of elements and any settlement or washing that may occur. Fill to any areas where settlement occurs required finished grade levels and re-establish grades to required elevations and slopes.

#### TREE PROTECTION

A. Prior to beginning any construction activity, the following steps are required to protect trees from damage:

1. Identify trees which will remain on the site. This includes not only those trees within the limit of work but also those which may have critical root zones within the area. This includes:

- Chemical and fuel storage
- Chemical waste of any kind
- Concrete washout areas
- Construction office placement and subcontractors offices
- Construction parking
- Construction vehicle corridors
- Crane placement and crane corridors for moving material (if applicable)
- Limb clearance of buildings and other features approved by University
- Material storage
- Other sub-contractors working areas must be approved by University
- Painting procedures and clean-up
- Soil stockpiling

- Steel make-up areas
- Trash stockpiling and hauling sites

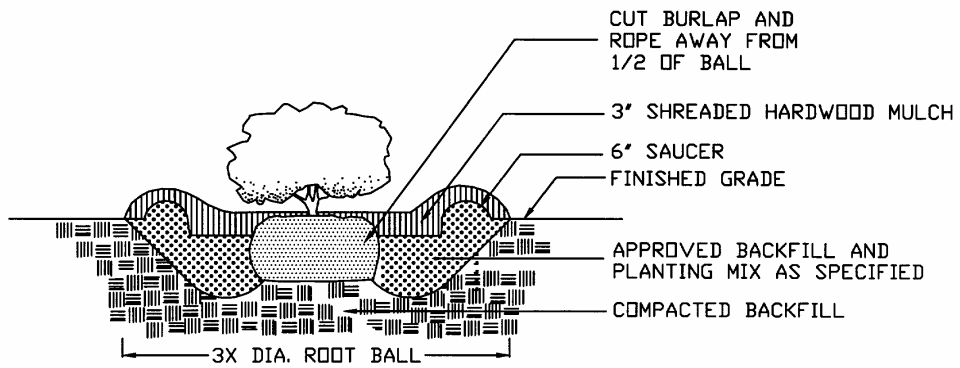
The critical root zone of a tree is defined as follows: A circular region measured outward from a tree trunk representing the area of the roots that must be maintained or protected for the tree's survival. This area is one foot of radial distance for every inch of tree diameter, measured at 4.5 feet about the ground, with a minimum radius of 8 feet.

B. Do not store materials, soil, equipment, etc. within the critical root zone (CRZ) of trees which are to remain. No construction activity, storage, parking, access or egress to the site shall occur within the critical root zone of established trees to remain on the site.

C. Provide, install and maintain a four (4) foot high temporary fence around the CRZ. Tree protection fences within the critical root zone must be completed prior to any construction. The fences must be maintained through the entire construction period.

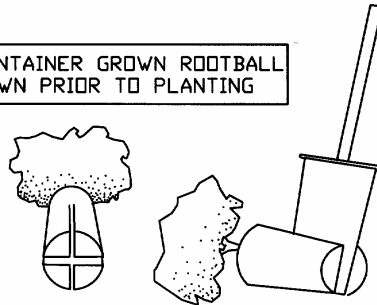
2.13 SITE STANDARDS

DWG. NO. 32



NOTE:  
PLANT TOP OF ROOT BALL 2" ABOVE GRADE

CUT CONTAINER GROWN ROOTBALL AS SHOWN PRIOR TO PLANTING



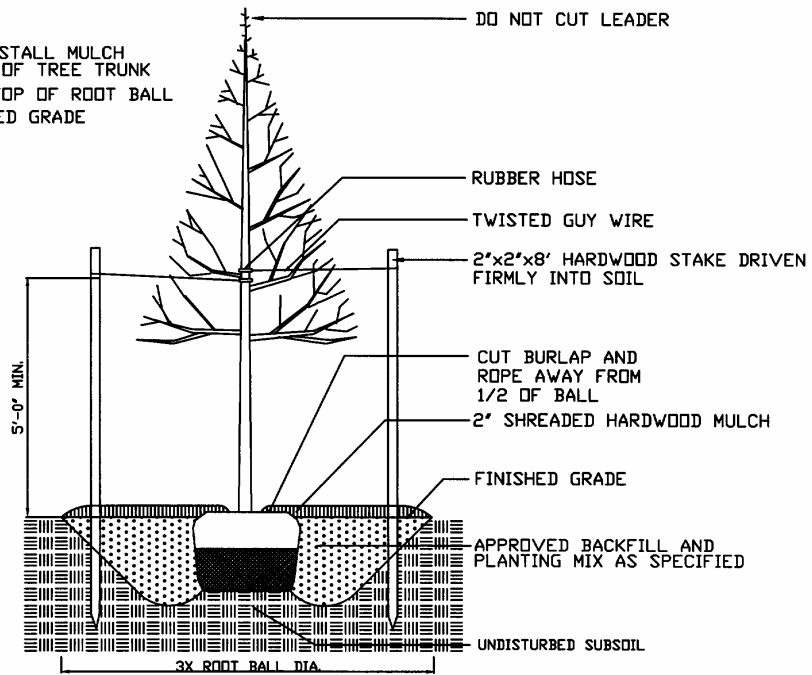
SHRUB PLANTING DETAIL  
NTS

2.13 SITE STANDARDS

DWG. NO. 31

**NOTE:**

1. DO NOT INSTALL MULCH WITHIN 6" OF TREE TRUNK
2. INSTALL TOP OF ROOT BALL AT FINISHED GRADE



TREE PLANTING DETAIL

NTS

END OF SECTION

## **SECTION 02200- EARTHWORK**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

#### **1.2 DESCRIPTION AND REQUIREMENTS**

- A. This section shall govern all earthwork for this project unless a specific earthwork requirement is included in another specification section. If earthwork requirements are part of other sections, those requirements shall govern; otherwise, the provisions and intent of this section shall govern.

### **PART 2 – PRODUCTS (Not Used)**

### **PART 3 - EXECUTION**

#### **3.1 EXCAVATION:**

- A. All excess material shall be removed off-site. Unauthorized excavation shall be corrected at no extra cost to owner.
- B. Existing earth materials may be used if they comply with this specification.
- C. Exposed subgrade shall be proofrolled to detect unsuitable soil conditions. If soft, organic, or plastic soils or other unsuitable materials are encountered during proofrolling, these materials shall be considered as unsuitable and shall be removed.
- D. The contractor shall maintain safe and stable slopes during excavation in accordance with accepted standards and regulations promulgated by U.S. Occupational Safety and Health Administration and the Maryland Occupational Safety and Health Administration.
- E. Trees, pavement, and all existing structures shall be protected during all earthwork operations.
- F. During all phases of construction positive surface drainage shall be maintained. Surface areas shall not drain into excavations or into areas with ongoing construction activities.
- G. Sediment and Erosion control shall be maintained per the requirements of MDE or as shown on the drawings.

- H. If unanticipated conditions are encountered, contact the Project Manager before proceeding.

**3.2 STRUCTURAL, DRAINAGE AND GENERAL GRADING FILL**

- A. Fill or backfill material under footings, slabs, and for support of structures (structural fill) shall comply with ASTM D2487 soil classification groups GW, GM, GP, GW-GM, GP-GM, SW, SM, SP, SW-SM, or SP-SM. Structural fill materials shall be free of rock or gravel larger than two inches, debris, waste, frozen materials, excess moisture, organic, vegetative or other deleterious matter.
- B. Backfill material which is to be used specifically for drainage for foundation walls, footings, or under slabs shall be a washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100% passing a 1.5 inch sieve and not more than 5% passing a No. 4 sieve. Materials complying with MSHA classification #57 shall be acceptable for drainage use.
- C. Backfill material which is to be used as pipe bedding or directly below asphalt pavement as a base course shall conform, as a minimum, to ASTM D2487 soil classification groups GW or SW with a maximum of 5% passing the No. 200 sieve. Asphalt Granular Base course materials may also comply with MSHA specifications for Graded Aggregate Base.
- D. Fill or backfill for general grading 5' or more from any structure, utility, or pavement which is to be landscaped shall be CL or better per ASTM and shall be free of rock or gravel larger than two inches, debris, waste, frozen materials, excess moisture, organic, vegetative or other deleterious matter.
- E. Test reports of any proposed structural, drainage or general grading backfill materials from off-site borrow sites shall be submitted by the contractor prior to acceptance by the University. Such test reports are the responsibility of the contractor.
- F. **PLACEMENT OF FILLS:**
1. All percentages are with reference to ASTM D698 or AASHTO T-99 (Standard Proctor Compaction Test) and are the minimum requirements. Fills shall be placed in lifts of no more than eight inches. Where fill is to be used to support any building or structure such as below footings or for replacement for undercut each lift shall be compacted to at least 95% of maximum dry density. Backfill within the first 12" below pavements or pavement granular base course shall be 98% of maximum and 95% below the first 12". General site grading shall be 90%. In all cases, moisture content shall be maintained within  $\pm 2\%$  of optimum. No layer of fill shall be placed on a frozen surface.
  2. Contractor shall maintain off-site conditions such as campus roads or parking lots and area roadways in a clean condition during transport of earth materials. These areas shall be

cleaned DAILY if spillage occurs. If problems persist, a washdown pit for all vehicles exiting the site shall be set up and maintained by the contractor at no additional cost to the University.

### **3.3 DEWATERING AND GROUND WATER CONTROL**

- A. Dewatering and ground water control shall be carried out as necessary by the contractor. A plan shall be provided by the contractor detailing how water will be controlled during construction. Ground water shall not be permitted to enter an excavated area from below. If water is found to be entering an excavated area from below, the contractor shall begin dewatering operations which lower the ground water elevation to a depth below the bottom of the excavation. A dewatering permit from MDE is required for any operation that removes groundwater from any excavation. Water from any source shall not be permitted to pond in any excavation.
- B. Maintain positive surface drainage away from all structures.

### **3.4 TRENCHES**

- A. TRENCHES shall be of necessary depth for proper laying of pipe and other subgrade utilities. Trench widths shall be sufficient to permit thorough tamping of backfill under haunches and around pipe. Bottom of trenches shall be accurately graded to provide uniform bearing and support for entire length of pipe.
- B. PIPE BEDDING under all piping six inches in diameter or larger shall be provided consisting of compacted granular material which complies with this specification. Pipe bedding shall be clean sand or gravel only. Bedding shall extend from the midpoint of the pipe cross section down to a depth of at least three inches below the pipe and shall fill the entire width of the trench.
- C. Unauthorized overdepths in excavation are to be backfilled with crushed stone, or gravel, thoroughly tamped. Whenever wet or unstable soil is encountered, such soil is to be removed to depth and extent required and trench backfilled to proper grade with crushed stone, or gravel.
- D. Trenches are to be backfilled in 8" layers, mechanically compacted to 1 foot above top of pipe. Any trenches improperly backfilled shall be reopened, then refilled and compacted to required grade and compaction. Along all portions of trenches, ground is to be graded uniformly in accordance with surface and grade required. Prior to backfilling, forms, trash and debris shall be cleared away. All work in trenches shall conform to MOSH requirements.
- E. Existing utilities where shown are based upon the best available data and have not, in general, been verified in the field. The contractor shall locate all existing utilities in the

vicinity of proposed work by digging test pits at all necessary points in advance of trenching.

### **3.5 TESTING**

- A. Earthwork and geotechnical testing for the purpose of quality assurance to establish conformance with the specifications shall be the responsibility of the Contractor. Testing by the University shall not relieve the contractor from his requirements under this contract.
- B. Contractor shall provide test reports on proposed off-site (i.e. outside limits of construction) borrow material as necessary to determine suitability. Reports shall be provided to the University at least three working days prior to anticipated placement on site.

### **3.6 EXECUTION**

- A. Identify required lines, levels, contours, and datum.
- B. Identify and flag known utility locations. Notify utility company as required to proceed with construction.
- C. Maintain and protect existing utilities which pass through work area which are to remain.
- D. Foundation or basement walls shall be adequate to support surcharge forces under service loads and during construction.
- E. Slope finished grade away from all buildings a minimum 2 inches in 10 ft (1.5%) unless noted otherwise.
- F. Excavate to elevations required for foundations. Where excavations are carried below building foundation lines, backfill excess excavation with concrete or #57 stone. Fill excess cut under slabs with well tamped stone or gravel. All building excavation work shall be subject to inspection and approval by the Project Manager before any concrete is placed.
- G. It shall be the Contractor's responsibility to properly shore excavations and to protect existing structures or utilities and to repair any damage occurring.
- H. Make no excavations to full depth when freezing temperature may be expected, unless footings or slabs can be poured immediately after excavation has been completed. Protect bottoms from frost if placing of concrete is delayed.

**\*\*\* END OF SECTION \*\*\***